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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, JON CARLTON

ART UNIT: PAPER NUMBER,

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/897,736

Applicant(s)

TRIFONOV ET AL.

Examiner

Jon Chang

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8-34 is/are rejected.
- 7) ☐ Claim(s) 4-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/31/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim Objections

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 16-35 have been renumbered 15-34. As the result of the renumbering, claim 28 depends from claim 27, claim 30 depends from claim 29, claim 32 depends from claim 31.

2. Claims 9, 12, 17 and 23-24 are objected to because of the following informalities:

- a) Claim 9 is redundant with respect to claim 8, from which it depends.
- b) In claim 12, line 1, "the central group" should read, "a central group".
- c) Claim 17 is identical to claim 16.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 23-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23-26 are unclear. There is either some words missing, or, they are depending from the wrong claims, and therefore lack proper antecedent basis for some of the terms.

Claims 27, 29 and 31 are unclear as they are drawn to methods but recite means. Claims 28, 30 and 32 depend from claims 27, 29 and 31 respectively.

Claim 33 is indefinite. For example, the claim recites "responses". Responses are generally related to something. However, in the claim, it is not clear what the responses are to. Further no definition of the terms (e.g., |c3|, etc.) is given within the claim, so their meaning within the context of the claim is unclear.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations being claimed, such as in claims 1-26, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification does not provide antecedent basis for claim 34.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 27 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by the article, "Local Radial-Angular Transformation of Images" by Trifonov et al. (hereinafter "Trifonov").

Regarding claim 1, Trifonov discloses a method of processing digital image data comprising:

overlaying a hexon pattern structure on the digital image data to define a central area comprising a pixel or group of pixels, the geometric pattern comprising a group of six pixels and/or a pattern of six groups of pixels surrounding the central area, the overlaying of the geometric pattern defining a geometric region in relation to the central area (page 235, right column, "hexagonal sampling"; Fig.1; Table 1),

assigning brightness values to the pixels within the groups of pixels and/or to individual groups of pixels (paragraph bridging pages 235 and 237, note "luminances"),

comparing the brightness values of the groups of pixels using a local radial angular transform (paragraph bridging pages 237 and 238, and the first 6 lines of the left paragraph on page 238), and

detecting regions of contrast within the image data (note page 235, last sentence of the first paragraph).

With regard to claim 27, Trifonov discloses a method of processing digital image data comprising detecting shapes of predetermined width in an image by means of application of a local radial angular transform to digital image data (note paragraph bridging pages 237 and 238, and the second and fifth paragraphs of the right column on

page 238; the predetermined width, would for example, be one pixel width, and the shape would be a line).

With regard to claim 29, Trifonov discloses a method of processing digital image data comprising detecting shapes of predetermined brightness or darkness with respect to their surroundings in an image by means of application of a local radial angular transform (see second and fifth paragraphs of the right column on page 238; note that the images are binary, so the brightness and darkness are predetermined).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 2-3, 8-22, 25-26, 28, 30 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Trifonov.

Regarding claim 2, Trifonov does not explicitly disclose that the detected regions of contrast are used to determine if a line is present within the image. However, Trifonov does disclose that luminance differential is determined (page 235, first paragraph). The Examiner takes Official Notice that it is well known lines result in a luminance differential. Therefore, it would have been obvious to one of ordinary skill in the art that in applying Trifonov's technique to an image, it would detect the presence of lines.

Regarding claim 3, Trifonov does not explicitly disclose that the detected regions of contrast are used to detect if a semi-plane is present within the image. However, Trifonov does disclose that luminance differential is determined (page 235, first paragraph). The Examiner takes Official Notice that it is well known half-planes result in a luminance differential. Therefore, it would have been obvious to one of ordinary skill in the art that in applying Trifonov's technique to an image, it would detect the presence of half-planes.

As to claims 8 and 9, Trifonov discloses the method of claim 1 wherein a transform coefficient is used to identify areas within the hexon pattern structure to detect where a luminance differential might be present (page 235, first and second paragraphs; Table 1. While Trifonov does not explicitly disclose a line, reference is made to the discussion applied to claim 2 above.

With regard to claims 10 and 11, see the discussion above for claim 3.

As to claim 12, Trifonov discloses the method of claim 8 wherein the hexon pattern structure comprises the central group of pixels and an at least one-axis symmetrical arrangement of surrounding pixel groups (Table 1).

As to claim 13, Trifonov discloses the method of claim 8 wherein the symmetrical arrangement comprises six surrounding groups of pixels, each group of pixels having the same number of pixels as other groups, and the number of pixels in the groups being between 1 and 100 (Table 1).

As to claim 14, Trifonov discloses the method of claim 13 wherein the comparing of a property is done by moving the central group of pixels uniform distances in relationship to the position of pixels in the image data (page 235, paragraph bridging left and right columns).

As to claim 15, Trifonov discloses the method of claim 14 wherein the comparing of a property is done by moving the central group of pixels uniform distances in relationship to the position of pixels in the image data. Trifonov does not explicitly mention storing the comparisons. However, this would have been obvious to one of ordinary skill in the art as image processing techniques generally provide for storing results of comparing (Official Notice), for subsequent use or for operator verification, for example.

Regarding claims 16 and 17, Trifonov discloses the method of claim 15 wherein the comparing of a property is done with a transform coefficient (see paragraph bridging left and right columns on page 235, paragraph bridging pages 237-238).

With regard to claim 18, Trifonov discloses the process of claim 16 wherein the uniform distance is approximately equal to a dimension of the central group of pixels (paragraph bridging left and right columns of page 235).

Regarding claim 19, Trifonov discloses the method of claim 8 wherein only lines within a range of predetermined width are detected (see remarks above for claim 2 with regard to "lines". Whatever inherent width the local radial angular transform disclosed by Trifonov can detect would be the predetermined width).

Regarding claim 20, Trifonov discloses the method of claim 8 wherein only lines of a predetermined darkness or brightness are detected (see remarks above for claim 2; note from the second paragraph in the right column of page 238 that binary images provide for predetermined darkness or brightness).

Regarding claim 21, Trifonov discloses the method of claim 8 wherein only lines of a predetermined orientation are detected (note the remarks above for claim 2, and the last sentence of the first paragraph of page 235).

Regarding claim 22, Trifonov discloses the method of claim 8 wherein only lines of a predetermined edge sharpness are detected (note the remarks above for claim 2. Whatever inherent edge sharpness the local radial angular transform disclosed by Trifonov can detect would be the predetermined edge sharpness).

Regarding claim 25, see the remarks provided above for claims 2 and 21 (note that lines inherently provide edges).

As to claim 26, see the remarks provided above for claims 2 and 22 (note that lines inherently provide edges).

With regard to claims 28 and 30, see the remarks provided above for claim 2.

As to claim 34, Trifonov, while disclosing the process of claim 1, does not explicitly disclose a computer having hardware and software that enables execution of the process of claim 1. However, the Examiner takes Official Notice that it is well known to implement image processing methods using hardware and software. Given the flexibility computers and software offer, and their widespread use in the art, it would have been obvious to one of ordinary skill in the art to utilize a computer having software to enable execution of Trifonov's process.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 13 of copending Application No. 09/900479. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of the instant invention is a

broader recitation of the invention and claim 13 of the application covers the equivalent subject matter as that of claim 1 of the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

13. Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 23-24, 31-32 and 33 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

References Cited

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,754,667 to Kim et al. teaches an angular radial transform image descriptor for describing shapes.

The article, "Invariant Image Recognition by Zernike Moments" by Khotanzad et al. teaches utilizing Zernike moments for rotation, scale and translation invariant recognition.


The article, "Edge Detection Using Orthogonal Moment-Based Operators" by Ghosai et al. teaches using Zernike moments for edge detection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
August 9, 2004